

Endangered, Threatened, and Protected Species: Challenges of Managing Living Marine Resources in an Internally Conflicted Regulatory Environment and the Opportunities They Present

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Natural resource management is a challenging undertaking in the best of circumstances. However, managing living marine resources is frequently confounded by the vast, alien, and oft-times hostile physical environment within which the organisms reside. The subtleties and complexity of the marine life-web, which in important respects have come to include the traditional relationships, forged over millennia, of individual human populations, all contribute to the intricate biological, political, economic, and social undercurrents that define and drive the management decision-making process.

The remarks and observations offered here pertain primarily to the U.S. Federal resource management process, as it bears on the exploitation and conservation of the fish, shellfish, mammals, birds, and other marine organisms of the U.S. Extended Economic Zone (EEZ). Prior to the establishment of the U.S. extended management zone, the principal role of the “Feds” in marine fisheries management was connected with bilateral and multilateral international agreements on “high-seas” access to (and conservation of) these open access or common-property resources. The predecessor agency of the National Marine Fisheries Service (NMFS), the Bureau of Commercial Fisheries, by-in-large, represented the U.S. “*marine fisheries management*” interests on the world’s oceans.

One may recall that, prior to the 1976 Fishery Conservation and Management Act (FCMA) which extended U.S. jurisdiction from 3 to 200 nautical miles seaward of the U.S. coast, “international waters” began (with only a few exceptions) at three miles. And, again with relatively few exceptions, fishery management “inside three” fell primarily to the adjacent State government agencies. The Bureau (and subsequently NMFS) provided scientific information on the condition of the resource base, as well as seafood trade expertise and modest domestic fishery development programs. But it was not until the FCMA that “management” of adjacent coastal, shelf, and slope living marine resources became a significant (some would say, *the* principal) focus of the U.S. Federal agency.

The process of managing the Nation’s living marine resources is, if nothing else, a work in progress. It has, over time, consisted of varying parts biological science, political science, economics, law, and social-psychology. Mix in the (occasionally conflicting) objectives and responsibilities of the various Executive Branch agencies, the Congress, and the Federal courts (to say nothing of the provincial interests of adjacent States) and one begins to “*appreciate*” how dynamic this process can be.

The development of fisheries management in the U.S. EEZ has, roughly, proceeded in a series of what might be viewed as “*gross stages*”. At the risk of oversimplification, these stages might be characterized in the following way. Using the region I am personally most familiar with (i.e., the North Pacific and Bering Sea) as my model, I’d suggest that, initially, the U.S. was confronted by a management environment over which it had little control, and with which it had almost no experience. Complex and relatively sophisticated “industrialized” fisheries, comprised of distant-water fleets representing the major fishing powers from around the globe (some with a long-standing presence in the newly claimed near-shore and shelf waters) operated with virtual autonomy within the newly extended EEZ. In most cases (with some important exceptions, e.g., king crab, Pacific salmon), these foreign fleets were exploiting stocks of fish which were best described as “under-“ or “un-utilized” by U.S. domestic fishermen and, thus, which represented a biomass which was not well understood by U.S. fisheries scientists and resource managers.

¹ This paper reflects the opinions of the author and does not necessarily represent the position of the National Marine Fisheries Service, NOAA, or the Department of Commerce. The author is solely responsible for any errors or omissions contained herein.

The principal challenge for U.S. managers, at this stage¹, was to establish some semblance of a monitoring and enforcement framework through which a degree of understanding, documentation, and control of “removals” could be achieved. Most of the actions taken by U.S. fishery managers in this initial stage involved creating mechanisms to “observe” fishing activity and collect catch statistics from these varied foreign operations. The over arching nature of the management debate tended to the *strategic*, even to the extent that “cold war” relationships colored some decisions. The role of economic analysis at this stage was relatively superficial, focusing primarily upon estimation of “gross product value” deriving from foreign commercial catches in the U.S. EEZ.

It wasn’t long, however, before the overt objectives for management of the zone shifted (although, clearly, this had been the implicit expectation from the inception of the “conservation zone”). Because, as noted, virtually all those participating in these industrial-scale fisheries were “foreign”, the next logical stage² was to “*Americanize*”. This was accomplished (although itself in stages) primarily by “... tossing the foreigners out...” and substituting in their place U.S. “domestic” capital and labor.

In these early years of the (by now) *Magnuson* Fishery Conservation and Management Act (MFCMA), the U.S. domestic industry had quite limited harvesting and processing capacity which could be brought to bear in these high volume/low unit value groundfish fisheries ... and often even *less* commercial interest. Species like Pacific hake and Walleye pollock were generally regarded by American fishermen as “trash fish”, unsuited for U.S. harvesters and processors. This absence of domestic capacity and intent, along with considerations growing out of international law (e.g., LOS), meant that the process of excluding foreign fleets from the U.S. zone would, itself, have to proceed in phases.

Initially, American managers sought to substitute the “catch” of U.S. harvesters for direct foreign harvests (i.e., joint-ventures between American fishermen and foreign factory processing ships). Next; processing and product technology was transferred from foreign to U.S. domestic operators (sometimes through outright purchase, while in other cases through joint-ventures). And finally, the U.S. managers sought to assure market access for newly created “domestic” processing capacity through direct

quid pro quo arrangements (i.e., *fish’n’chips* access allocation policy).

Because of the way in which U.S. regulations and laws governing development and implementation of fisheries management actions have been written and interpreted, the process of promulgating rules to achieve “Americanization” often involved little more than documenting that “... *domestic capacity and intent*” to exploit a fishery resource existed. In this way, TALFF (total allowable foreign fishing) was superceded by JVP (joint-venture processing), which was superceded by DAP (domestic annual processing) operations.

Economic analysis was employed at this stage principally to “rationalize” transfers from foreign to U.S. domestic users. In the mandatory “benefit-cost” calculus that accompanied these management actions, economic ‘efficiency’ and ‘equity’ were not overriding considerations. Instead, actions which tended to increase U.S. domestic participation in a fishery, no matter how great the cost to foreign operators, was, by default, viewed as a “net improvement”. This was so because, as variously interpreted by the executive branch, congress and the courts, “...*only surplus changes accruing to U.S. citizens...*” counted, when evaluating the net economic and socioeconomic effects of a management action. Incidentally, this assessment prescription persists, to the present, under U.S. law.

Having largely completed the congressionally mandated “Americanization” of the U.S. EEZ³ by the late-1980s, the next major step in management of the U.S. zone involved the largely political process of “dividing-the-spoils”, so to speak, amongst the successful (ostensibly “domestic”) fishing and processing enterprises. This phase⁴ continues, at present, through a number of mechanisms (e.g., ITQs, CDQs, harvesting-processing cooperatives, access limitation programs) which, to a greater or lesser degree, approximate transference of “property interest” in the fishery resource from the public sector (common property pool) to private control.⁵

¹ Stage I: “Gain management control over the zone’s living marine resources.”

² Stage II: “Reallocate living marine resources *from* foreign users *to* Americans users.”

³ Some would argue that we have not been fully successful in “Americanizing” these fisheries, to the extent that there remains substantial foreign ownership and control of productive capacity (e.g., vessels, plants, processing equipment) in many of these fisheries. This has largely been accomplished through “foreign direct investment” in ostensibly “American” fishing companies.

⁴ Stage III: Reallocate marine resources from domestic user “A” to domestic user “B”.

⁵ A recent estimate prepared at AFSC suggests that over 70% of the total value of fisheries under FMP regulation, in the EEZ off Alaska, are managed under some form of

The demands placed upon the economic analyses in this management phase have been substantially increased over those which characterized the former stages. Through new legislation, executive fiat, and pronouncements from the U.S. courts, a far greater concern about “balancing” efficiency and equity considerations among competing (domestic) *user groups*⁶ has emerged in this stage of U.S. fishery management. Because all the players are now, by definition, wholly domestic (within the legal bounds of that term), the attributable costs of any proposed management action imposed on any given user must be “netted out” of the potential gains from that action, which might accrue to any and all other users.

This is not to suggest that “economic efficiency” has become the paramount criterion used to rank competing management approaches. Neither should it be assumed that every “domestic” interest group enjoys equal standing in this process. Indeed, the Congress (either directly through legislative mandates or indirectly through the Fishery Management Councils) and the Federal courts have expressed society’s desire to differentially “weight” the interests of some groups of users, relative to those of other groups, in the allocative process (e.g., “small” entities versus “large”; “inshore” processors versus “at-sea” processors; hook-and-line gear operators versus trawl operators).

These institutional expressions of “social preference” regarding the economic disposition of allocative management actions have become an increasingly important component of the impact assessment process (e.g., Regulatory Flexibility Act). Considerations, such as sector-specific market share, profitability, short and long term economic viability, ease of entry and exit, access to capital, labor effects, etc., have been added to the heretofore more typical analytical mandates of assessing the aggregate economic performance of a given fishery, in response to a proposed management action in the U.S. EEZ. In every case, however, traditional “market” mechanisms, data, and analytical techniques (e.g., B/C, I-O) have been the basis for these comparative economic analyses.

To anyone familiar with the U.S. marine resource management process, it is clear that successive stages tend to overlap, to a lesser or greater extent (e.g., foreign-U.S. joint ventures served as the transition between “fully foreign” and “fully Americanized”). And it seems certain

“market-based” program, e.g., IFQs, CDQs, co-ops.

⁶ That is, as distinct from groups whose “interest” in these resources might be characterized as non-use or passive-use, and has been articulated only somewhat more recently, in the process, as described below.

that the process of “privatizing” and “rationalizing” the commons will continue for some time into the future. Nonetheless, it is my sense that U.S. fisheries management is on the brink of yet another transition. In my view, this emerging stage⁷ involves what might be characterized as the “greening” of the marine fisheries management process or, perhaps alternatively, the reassertion of society’s “collective interest” in these traditional common property resources.

However one characterizes it, this latest phase presents unique challenges to the U.S. management process. Unlike the earlier stages characterized above, however, the regulatory institutions and procedures may be ill-prepared and unsuited to address these new challenges. This is so because (with perhaps a few exceptions) management of the U.S. EEZ has focused principally on monitoring, developing, promoting, and regulating the “exploitation” of these marine resources for human food and/or industrial uses. Managing for competing “non-use”⁸ demands, including integrated ecosystem needs⁹, is a relatively new consideration.

In a nutshell, when market failures occur or, more to the point, when markets do not exist within which some impacted resources are ‘traded’, the question becomes, “how shall society evaluate the *tradeoffs* it is explicitly or implicitly making, when it takes a management action (or fails to take such an action)?” Increasingly, the challenge confronting the U.S. management authorities is to integrate market and nonmarket values and valuation techniques and methodologies ... but to do so (meaningfully) within the constraints and prescriptions of existing laws, institutions, and practices.

While the challenge is certainly not unique to U.S. marine fisheries management (e.g., consider the struggle over

⁷ Stage IV: “Reassert the ‘public’ interest (which includes non-use applications) in management of living marine resources, even as ‘private-property’ interests and institutions are strengthened.”

⁸ Some have certainly struggled with similar issues in the context of, for example, recreational use, but the techniques developed there only scratch the surface of this problem as it pertains to endangered, threatened, and protected resources.

⁹ Recently, a suggestion was made that, as we “parcel out” ITQ we may increasingly need to formally set aside a “share” for ESA/MMPA species, as well. At present, the predator/prey relationships are subsumed in the catch-all “rate-of-natural-mortality”, when deriving ABC. A more explicit “allocation” would make the dependent predator/prey relationships transparent (although to do so would likely exceed our current understanding and data).

timber harvests on U.S. public forest lands of the Pacific Northwest in the face of the listings of the spotted owl or marbled murrelet) endangered, threatened, and protected resources are increasingly the subject of concern (and conflict) in this arena. In many instances, the interactions between protected species and traditional fisheries are well known and clearly understood (e.g., turtles and shrimp trawls, sea birds and baited longlines). In other cases, the relationships are less well documented, but *assumed* on the basis of substantial circumstantial evidence (e.g., the presumed commercial fisheries' contribution to Steller sea lion population declines in the Northeast Pacific and Bering Sea). And, some simply transcend the boundaries of our fishery management experience (e.g., Pacific salmon versus hydro, agriculture, riparian land use, forest practices, aquaculture, mixed-stock target fisheries and bycatch interceptions).

Worldwide, the list of threatened, endangered, and protected marine species seemingly grows with each passing hour. In the U.S., accompanying these listings has come new "mandates" from the Congress and the Federal courts (and in some cases, from International authorities empowered to regulate through treaty agreements) directing that the management agencies "protect", "enhance", "mitigate", and "facilitate recovery" of these designated species/habitats... while simultaneously assuring that "*net National benefit*" is maximized. This increasingly produces a resource management dilemma, as apparently conflicting and contradictory objectives, mandates, and regulations impinge on the decision-making process.

Some have asserted that the essence of the problem emerges from the implicit assumption (generally interpreted to be embedded in statutes like the Endangered Species Act and Marine Mammal Protection Act) that the "benefits" to the Nation, attributable to any action which... "*protects*", "*enhances*", "*mitigates*", and "*facilitates recovery*"... of an endangered species/habitat, *always* exceeds the associated cost of that action. While one may quibble over this interpretation, it is, in effect, the operative definition being employed by managements of living marine resource in the United States.

But, what this suggests is, "... there is no cost which is too great for society to pay, to '*protect*', '*enhance*', '*mitigate*', and '*facilitate recovery*' of (for example) a unique run of sockeye salmon which spawns in Idaho's Snake River drainage; or the short-tailed Albatross; or even a bed of Johnson's sea grass." Clearly, this is a nonsensical conclusion (except, perhaps, in the limit, when irreversibility is the outcome), since at the margin, for most listed or protected resources, the value of an incremental unit change is almost surely finite.¹⁰

¹⁰ Especially, given the degree of uncertainty that exists

However, absent the ability to measure (or even qualitatively address) the implicit benefit or cost of such an incremental change, the information provided to the decision-making process by the analyst is often relegated to relatively narrow "least-cost" (e.g., engineering) comparison which seek to contrast a range of competing alternative management actions, given a fixed, but largely unevaluated, objective.

A quick survey of NMFS economics practitioners around the nation suggests that "least-cost" assessments are the prevailing analytical approach adopted when "protected" or "threatened" resources are at issue. While perhaps an understandable outcome, the resulting "analysis" provides very little insight as to the "true" costs and benefits accruing to society from any given action. This is an unsatisfactory (and often unsatisfying) solution, with potentially significant "downside" costs for all those who are concerned about the stewardship, conservation, and rational management these living marine resource assets.

This is principally so for at least two reasons. First, the implicit *a priori* "finding", accompanying these regulations, that "...benefits always exceed costs", has produced a not insignificant backlash, among some segments of the American population, against the provisions of (what some have referred to as) the nation's "environmental" laws (e.g., ESA). The merits of many of the arguments being made to rescind or substantially abridge these legal provisions (as well as the motives of those making them) can be debated. What is not in question, however, is the growing political momentum in the United States to significantly alter these environmental regulatory rules, largely because of what some see as their unreasonable and inflexible application within the nation's natural resource management context.

The second challenge is somewhat more esoteric, but perhaps no less potentially "costly", from a national resource management perspective. Increasingly, it seems, groups which, for the largest part, have been absent (some would argue consciously excluded) from the marine resource management debate, have begun to assert their perceived interests by appealing to the U.S. Federal courts. And, increasingly, the courts have exhibited a tendency to be less deferential to agency assertions and arguments, and instead adhere scrupulously to (especially) the procedural strictures of the various environmental acts, laws and rules.

about the fundamental biology of many of these protected resources, e.g., status of the stock, potential rates of recovery or decline, habitat carrying capacity, broader ecosystem interactions, etc.

Expressed alternatively, when, for whatever reason, a group cannot prevail in the political arena, there has come to be an increasing tendency for it to seek relief from the courts, often on the basis of the “legal adequacy” of the process (e.g., the supporting analyses) and careful adherence to procedure. And, increasingly in recent experience, the U.S. Federal courts have demonstrated a willingness to intervene. Judicial interventions, by default, increase the cost of decision-making, call into question the legitimacy of the process, and, in some cases, potentially threaten the very resource(s) being managed, by delaying, critically altering, or preventing management actions believed necessary by the agency.

But, a careful review of the principal U.S. Acts, laws, executive orders, and regulations¹¹ which prescribe procedures and approaches (or “mandate” application of specific assessment techniques), can be seen to introduce conflicting (or, at the very least, confounding) assumptions and expectations. In the face of these analytical prescriptions, State and Federal agencies responsible for the “*management of living marine resources*” are confronted by new challenges in preparing “legally adequate and defensible” economic and social impact assessments, in support of marine resource management actions.

While this represents a serious problem (some would argue, bordering on crisis) for those of us charged with conducting these “... *legally adequate*” analyses in support of regulatory, conservation, or management actions, it represents an extraordinary opportunity for the broader economic research community. At a conceptual level (for example): “What is the meaning of ‘value’, within the context of endangered species management?”; “What lies behind society’s demand for the protection of (in particular) these living marine resources (e.g., are they regarded as ‘environmental indicator species’; are they principally ‘cultural’ assets)?”; “What is the nature of a ‘private property-right’ to access, when control and management of the resource itself is retained by one or more ‘public sector’ agencies?”

Research opportunities exist in the areas of empirical baseline studies of the “value” of threatened and protected resources (whether “categorical” or “species-specific”); development of quantitative and qualitative measurement techniques; extension of traditional “economic” and/or “biological” paradigms toward integrated bio-economic (and ultimately ecosystem) management models; and

research into balancing (at the margins) the inevitable tradeoffs which will occur between “use” and “non-use” interests in the Nation’s living marine resources... all these (and surely many more) represent a contribution eagerly awaited by those of us “...*in the trenches*”.

Conclusions

So, the “appeal” being made is for help from the academic community to assist Agency/council economists in development and application of technically sound means of integrating these competing value structures (market-based versus non-market) into the “process”, as it is currently mandated.

A better integration of traditional market-oriented management (and analytical) technique, with those of nonmarket/nonuse approaches, may enhance the understanding and acceptance of these legal mandates, and the inevitable societal “takeoffs” they engender.

Pragmatically, when, in the course of managing natural resources in the U.S. public domain, the political/administrative system fails to adequately address all the “legally mandated” requirements accompanying the decision, that decision becomes vulnerable to legal challenge. The result then is substitution of “judicial” authority for “administrative” authority, legal dictates and procedures for scientific evidence and the public political process. In our system of “checks and balances” the courts have the critical role of safeguarding the interests of all, in the governance process. But, the courts are poorly prepared (and I think, for the most part, genuinely reluctant) to perform the administrative function of “managing” the Nation’s natural resources.

At present, with the (real or perceived) conflicted objectives reflected in many of the laws and regulations governing the public resource management process in the United States, the courts will find themselves, willingly or unwillingly, thrust into this role, largely on “procedural” grounds. Our challenge must be to “minimize” the need for the courts to usurp management authority, by reducing the “procedural” deficiencies in the public decision making process, as that process pertains to the Nation’s natural resource assets.

¹¹ See, for example, E.O.12866, Magnuson-Stevens Fishery Conservation and Management Act (with National Standards), Regulatory Flexibility Act, Endangered Species Act, Marine Mammal Protection Act, Sustainable Fisheries Act (with Essential Fish Habitat) .